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a *sine qua non*. Yet some statements have a curiously antique flavor. PRINGSHEIM's old screen theory of chlorophyll appears on one page and on the opposite one the modern theory is stated, but no decision as to their merits is reported. The amount of CO_2 in the air still appears as .04 per cent, and the starch formula as $\text{C}_6\text{H}_{10}\text{O}_5$. The work of two decades on solutions and osmosis is overlooked, for its bearing on the entrance of water, salts, and gases and on the movement of water and foods scarcely appears. The great advances in the last five years in the knowledge of perception, perceptive regions, and the interrelations of reactions find no reflection in this book, though they belong to its very essence.

Dr. CLEMENTS set himself a very difficult task; perhaps an impossible one, if we do not mistake the trend of recent study. That must be allowed for. Our main criticism, however, is not upon the choice of material for a brief treatise; it is against the attitude of mind that can tolerate vague explanations and invalid reasoning, and against a treatment of fundamental topics which is ineffective and not in accord with present knowledge.—C. R. B.

Jost's Plant physiology

When we reviewed this book in its original German,² we expressed the opinion that it was "easily the best work on plant physiology in any language, for the general student." Further use of it has confirmed this opinion, though it has at the same time uncovered some weaknesses that did not appear on the surface. It still remains as adequate a presentation of the fundamental features of plant activity as is likely to be made by any one author. Though it lacks the suggestiveness and comprehensiveness of PFEFFER, and can by no means replace that indispensable work, its clear and picturesque style adapts it better to the advanced student and teacher. Our hope that it would be translated into English has just been fulfilled. The Clarendon Press secured the right of translation and Professor HARVEY GIBSON, of the University of Liverpool, is responsible for the work.³

There has been no editing of the author by the translator. Even the index is a translation. Dr. JOST himself has added some notes and embodied some corrections; but these are relatively few and brief, and might well have been a more marked feature of the English edition.

A literal translation was the aim, says the preface, but that certainly has not been attained. It is not difficult to find passages where wholly gratuitous changes have been made, qualifiers added or omitted, or variant expressions used, that leave the phrase far from a literal translation. For example: "höchstens ganz gelegentlich musste erwähnt werden . . ." is rendered "we drew special attention to the fact . . ." when the fact *was* only incidentally mentioned; and "wachstumsfördernde Wirkung" appears as "stimulating effects," with growth

² BOT. GAZETTE 37:390. 1904.

³ JOST, LUDWIG, Lectures on plant physiology. Authorized English translation by R. J. HARVEY GIBSON. Imp. 8vo. pp. xiv + 564. figs. 172. Oxford: Clarendon Press. 1907. Cloth 21 sh., morocco 24 sh.

not alluded to in the context. "Quite, or almost quite, impermeable" for "sehr schwer oder gar nicht permeabel" surely must be a typographic slip for "almost or quite impermeable." When JOST wrote "der im Wasser gelösten Moleküle und Ionen," why should it be translated, "of the molecules dissolved in water and of the ions," as though the ions were not dissolved in water? There are other slips of more serious nature. Thus, in describing the cohesion movements of the annulus of ferns and the anthers of seed-plants, to render "Füllwasser" by "imbibition water" makes the description inconsistent and unintelligible, for it is the water contained in the cell cavity, not the imbibed water of the walls, whose tension comes into play.

If these defects appear in a cursory examination one may suspect that a thorough comparison would reveal many others. Yet the total impression, without such a search, is quite the reverse, and it may be fairly said that on the whole the translation, though rather wordy, is good. The English may not be irreproachable, but it happily does not fall into the German idiom.

We note JOST's lame excuse for retaining assimilation instead of adopting photosynthesis, pleading bad examples and the lack of a correlative term to apply to "nitrogen assimilation." A little boldness, pardonable in a leader, would have set aside the examples of PFEFFER and WIESNER, and a little ingenuity would have devised a new term, if amide synthesis and proteid synthesis were not acceptable. A bit more boldness in the translator would have at least harmonized the typography of citations with the better style of the original, and not overmuch would have modernized it completely. Now it halts between the traditional and the modern, losing much of the modest advance the author had made.

In makeup the book follows the general style of the Clarendon Press classics. The thicker but lighter paper, the solid type and slightly larger page, make a bulkier book, actually larger by some 60,000 words, fall within the compass of 554 pages of text as against 682 in the original. The rough-surfaced paper makes impossible the proper printing of the delicate cuts of the German edition, the half-tones especially being mere smudges. The figures should have been remade for such paper. Yet we can almost forgive the blotchy cuts for the sake of the dull surface and the agreeable lightness of the book. But the price, as usual, goes away up—21 to 24 shillings as against about 15 marks—and imported copies at \$7.75 will be almost too dear for general students. Yet it is well to have it available in English even at the exorbitant price.—C. R. B.

The morphology of plants

DR. JOS. VELENOVSKÝ⁴ has added to the lengthening list of general textbooks on plant morphology. Every such work represents some characteristic point of view, and that of VELENOVSKÝ seems to be that of the older morphology tintured

⁴ VELENOVSKÝ, JOS., *Vergleichende Morphologie der Pflanzen*. Vols. I and II. pp. 731. pls. 5. figs. 455. Prag: Fr. Řivnáč. 1905 and 1907.